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Case Docket No. 60,130-740Date: February 15, 2000ASSISTANT COMMISSIONER FOR PATENTS
Washington, D. C. 20231

Sir:

Transmitted herewith for filing is a patent application of

Inventor(s): John Raasakka, John E. Long and Roch J. Tolinski

For:

Enclosed are:

- ☒ 1 sheets of drawings.
- ☒ An Assignment of the invention to Meritor Light Vehicle Systems, Inc.
- ☒ A certified copy of a application.
- ☒ A Combined Declaration and Power of Attorney
- ☒ An associate power of attorney.
- ☒ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.
- ☒ PTO Form 1449 with copies of patents cited in specification.

The filing fee has been calculated as shown below:

	No. Filed	No. Extra	Small Entity	Large Entity
Basic Fee			\$345	\$690
Total Claims	11-20	0	X9 -0-	x18 -0-
Indep. Claims	2-3	0	x39 -0-	x78 -0-
Multiple Depend. Claim(s) Present			\$130 -0-	\$260 -0-

Total \$ Total \$690.00

- ☐ Please charge my Deposit Account No. 08-2789 in the amount of \$
- ☐ A duplicate copy of this sheet is enclosed.
- ☐ A check in the amount of \$690.00 to cover the filing fee and \$40.00 for the assignment recordation is also enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 08-2789.
- ☒ Any additional filing fees required under 37 CFR 1.16.
- ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

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Dated: February 15, 2000

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j-c-688 U.S. PTO

09/504154

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SIMPLIFIED WIND DEFLECTOR FOR VEHICLE ROOF CLOSURE

BACKGROUND OF THE INVENTION

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This application relates to a wind deflector for a vehicle roof closure wherein the wind deflector is moved between extended and stowed position based upon movement of the closure member.

Modern vehicles are often provided with a closure in the roof which is
10 movable between an open and closed position. These closures are typically known as moon roofs or sunroofs. The closures are selectively moved between the open position at which they open an aperture in the ceiling, or to the closed position at which they close the aperture.

When the closure is in the open position, a good deal of wind may move into
15 the cab of the vehicle. Since this wind is often directed at the vehicle occupants, the closures are often provided with wind deflectors forward of the aperture. The wind deflectors serve to direct wind around the wind deflector, such that it is not directed at the occupants of the vehicle.

However, the wind deflectors have also needed to be moved between a
20 stowed position when the closure is closed, and to an extended position when the closure is opened. The movement has presented design challenges.

Known wind deflectors have been relatively complex, and have typically relied upon separate drive members to move between the extended and stowed position. The prior art wind deflectors are thus quite complex.

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SUMMARY OF THE INVENTION

In a disclosed embodiment of this invention, a wind deflector is positioned forward in an aperture in a vehicle roof. The wind deflector is biased toward one of a stowed or open position, and moved to the other upon movement of the

closure member. In a preferred embodiment, the wind deflector is biased to an extended position at which a deflector portion extends upwardly of the aperture. A spring biases the deflector to this position. The closure member moves against the wind deflector to force it to its stowed position.

5 Preferably, the wind deflector is mounted within a mount portion such that it has a stop member which stops further movement of the wind deflector when the wind deflector is biased to its extended position. In a preferred embodiment, this stop is provided with a tab extending downwardly from the wind deflector which contacts a portion of the mount. The stop prevents further movement of the wind
10 deflector. In a most preferred embodiment of this invention, the wind deflector is pivotable about a pivot axis, and spring biased about the pivot axis to its extended position. The stop prevents further movement of the wind deflector. The closure member contacts the wind deflector and acts in opposition to the spring bias to force the wind deflector to its stowed position.

15 These and other features of the present invention can be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a vehicle roof with a wind deflector in an extended
20 position.

Figure 2 shows the wind deflector of Figure 1 having been moved to the stowed position.

Figure 3 is a rear view of the inventive wind deflector.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

A vehicle roof 20 is illustrated in Figure 1 having a selectively movable closure 22. As is known, a vehicle operator can selectively move the closure member 22 between open and closed positions. At the closed position, the closure member 22 is positioned in a sealing relationship with a seal 24 adjacent a forward end of an aperture 25.

As shown, a wind deflector mount 26 is positioned adjacent a forward end of the aperture 25. A pivot axis 28 pivotally mounts a spring 30. Spring 30 has a first finger 32, a ring portion 34 mounted about the pivot axis 28 and a second finger 36. First finger 32 abuts a surface of a wind deflector 38. The wind deflector 38 has an aerodynamic front surface 40 which directs wind away from aperture 25 when in its extended position such as illustrated in Figure 1. A rear stop portion 42 abuts a rear portion of the mount 26 in this position. The spring 30 biases the wind deflector 38 to the position illustrated in Figure 1. The stop 42 prevents further rotational movement of the wind deflector 38 about the axis 28, as will be explained below.

As can be seen in Figure 2, when the closure member 22 is moved forwardly to its closed position, it contacts the wind deflector 28 and forces it against the force of the spring 32 to move to its stowed position. In the stowed position, the wind deflector 38 has pivoted about the pivot axis 28. As shown in Figure 2, the wind deflector is now stowed. The present invention thus provides a very simple wind deflector structure which does not require a separate motor, or elaborate mounting structure.

Figure 3 is a rear view of the wind deflector 38. Pivot arms 50 from deflector are mounted in the mount 26 to define the pivot axis. Ring portion 34 of

spring 30 is mounted on arms 50. There may be springs 30 at each lateral side, although there may be a single spring. Also, the spring could be mounted in the center of the wind deflector. As can be seen, the stop 42 abuts a lower surface 44 of the mount 26. As can be appreciated, the spring fingers 32 and 36 abut
5 respective surfaces on the wind deflector 38, and mount 26, as illustrated.

In summary, a very simple wind deflector movement structure is disclosed. The present invention greatly simplifies the mounting and movement of the wind deflector structures.

A preferred embodiment has been disclosed; however, a worker of
10 ordinary skill in this art would recognize that modifications would come within the scope of this invention. For that reason, the following claims should be studied to determine the true scope and content of this invention.

CLAIMS

1. A vehicle roof comprising:
 - an aperture;
 - a roof closure member movable between open and closed positions, and said
 - 5 closure member enclosing said aperture when in said closed position, and exposing said aperture when in said open position; and
 - a wind deflector, said wind deflector being movable between an extended position at which it extends above said closure member and said aperture when said closure member is in said open position, said wind deflector being
 - 10 movable to a stowed position, and said wind deflector being biased to at least one of said extended and said stowed position, and movable based upon movement of said closure member to the other of said extended and closed position.
2. A vehicle roof as recited in Claim 1, wherein said wind deflector is pivotable
- 15 about an axis in a mount between said extended and stowed positions.
3. A vehicle roof as recited in Claim 2, wherein said wind deflector has an aerodynamic front surface.
4. A vehicle roof as recited in Claim 2, wherein said wind deflector is biased to said extended position by a spring mounted on said pivot axis.
- 20 5. A vehicle roof as recited in Claim 4, wherein said spring has a first finger contacting a portion of said wind deflector and a second finger contacting a portion of said mount.
6. A vehicle roof as recited in Claim 2, wherein said wind deflector is biased to said extended position and moved to said stowed position by said closure
- 25 member as said closure member moves to said closed position.

7. A vehicle roof as recited in Claim 6, wherein a stop on said wind deflector contacts a surface on said mount to prevent further rotation of said wind deflector relative to said mount when said wind deflector is in said extended position.

8. A vehicle roof closure assembly comprising:

a closure member movable between open and closed positions, said closure member opening an aperture in said open position and closing the aperture in said closed position; and

5 a wind deflector mounted to be pivotable between an extended position and a stowed position, said wind deflector being biased to said extended position and being in said extended position when said closure is in said open position, said wind deflector extending upwardly above a vertical position of said closure when in said extended position, and said wind deflector being pivotable to a
10 stowed position at which it is below said closure member, said wind deflector being biased toward said extended position by a spring mounted on a pivot axis, said wind deflector being pivotable in a mount, and said spring being mounted on said pivot axis.

9. A closure assembly as recited in Claim 8, wherein said spring has a first finger
15 contacting a portion of said wind deflector and a second finger contacting a portion of said mount.

10. A closure assembly as recited in Claim 8, wherein said wind deflector has a stop surface which contacts a surface of said mount when said wind deflector has been biased to said extended position to prevent further rotational
20 movement of said wind deflector.

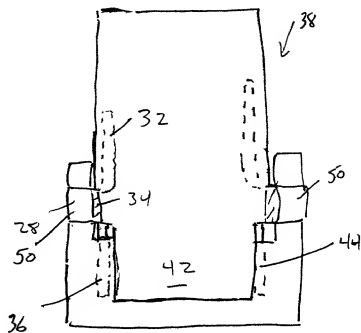
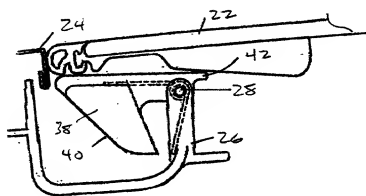
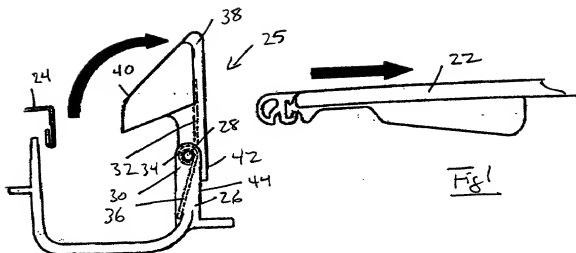
11. A closure assembly as recited in Claim 10, wherein said mount has mount structures for pivotally mounting said wind deflector, and said stop on said wind deflector contacting a surface laterally between said mount structures to provide said stop.

ABSTRACT OF THE DISCLOSURE

A vehicle roof closure assembly is movable between open and closed positions. A wind deflector is biased to an extended position at which it extends vertically upwardly of a forward portion of an aperture. The wind deflector serves

5 to deflect wind away from the cab of a vehicle. However, when the closure member is moved to its closed position, it contacts and forces the wind deflector to a stowed position. The present invention reduces the complexity of wind deflector structures.

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COMBINED DECLARATION AND POWER OF ATTORNEY

As the below named inventors, we hereby declare: that our residences, post office addresses and citizenships are as stated near our names below; that we are joint inventors and we believe we are the original and first inventors of the subject matter of which is claimed and for which a patent is sought on the invention entitled

SIMPLIFIED WIND DEFLECTOR FOR VEHICLE ROOF CLOSURE

which is described and claimed in the attached specification and amended by an amendment thereto submitted therewith (if any); that we have reviewed and understand the contents of this specification, including the claims, as amended by any amendment referred to above; that we do not know and do not believe the same was ever known or used in the United States of America before our invention thereof or patented or described in any printed publication, in any country before our invention thereof for more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application; that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by us or our legal representatives or assigns more than twelve (12) months prior to this application; that we acknowledge our duty to disclose information of which we are aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a); and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by us or our legal representatives or assigns except as follows: NONE.

We hereby appoint M. Lee Murrah, Registration No. 27,460; Theodore W. Olds, Registration No. 33,080; John E. Carlson, Registration No. 37,794; David J. Gaskey, Registration No. 37,139; Kerrie A. Laba, Registration No. 42,777 Randall L. Shoemaker, Registration No. 43,118; Samuel J. Haidle, Registration No. 42,619; William Gottschalk, Registration No. 44,130; David L. Wisz, Registration No. P46,350; David M. LaPrairie, Registration No. P46,295; and Bharat C. Gandhi, Registration No. 35,146 as our attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith. Please address all correspondence and telephone calls to:

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We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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